Endodontic flare up

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flare up

and /or

Introduction

ENDODONTIC EMERGENCIES

1. Pretreatment

- 1- acute pulpitis
- 2- APA
- 3- APP
- 4- Traumatic injury

2. Intra-appointment

- **1. Mid .tre. flare up**
- 2. Exposure of pulp
- 3. Fracture of tooth
- 4. Recently restoration
- 5. Periodontal treatment

3. Postobturation.

- 1. Overinstrumentation
- 2. Overextended filling
- 3. Underfilling
- 4. Fracture of root
- 5. High restoration

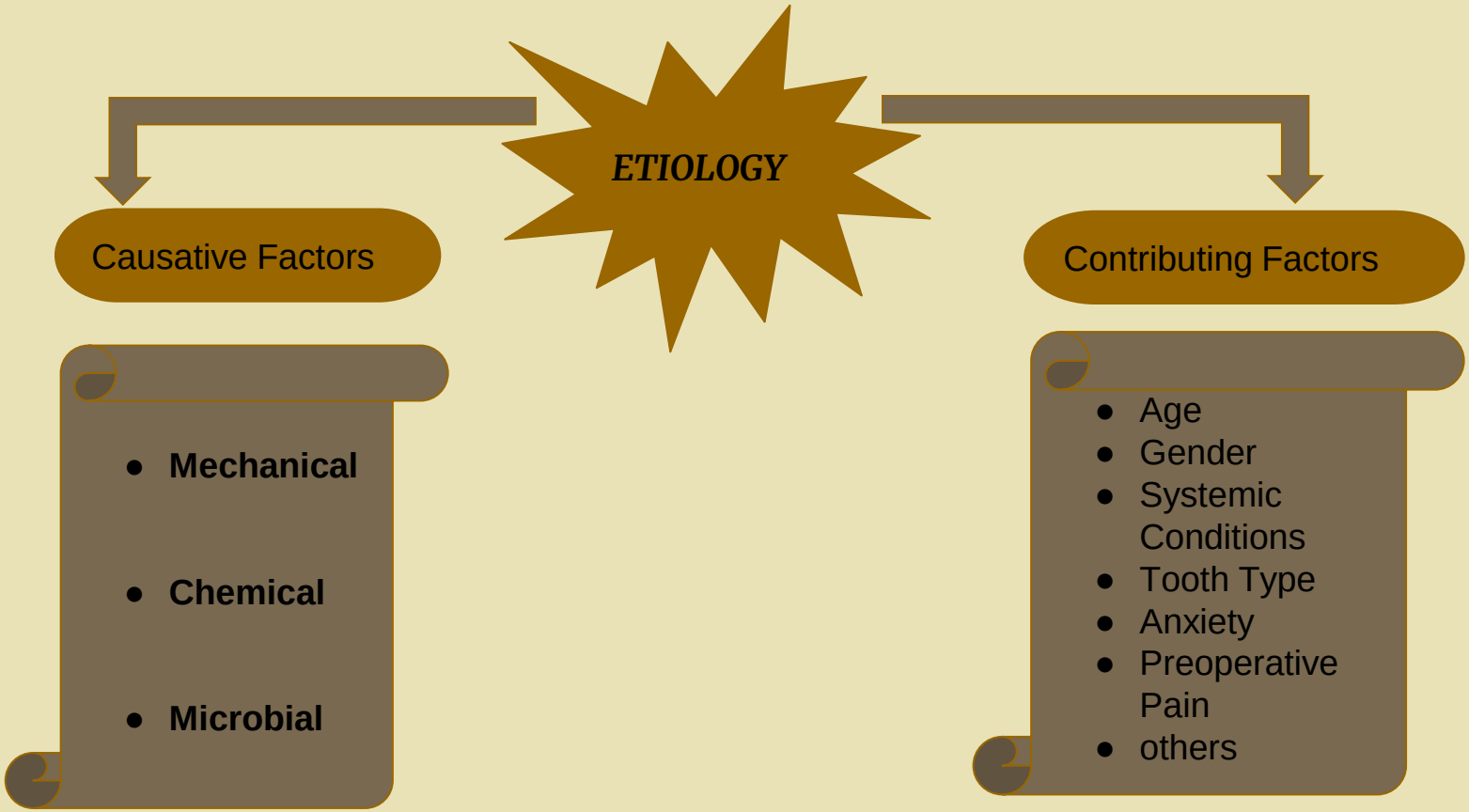
Definitions

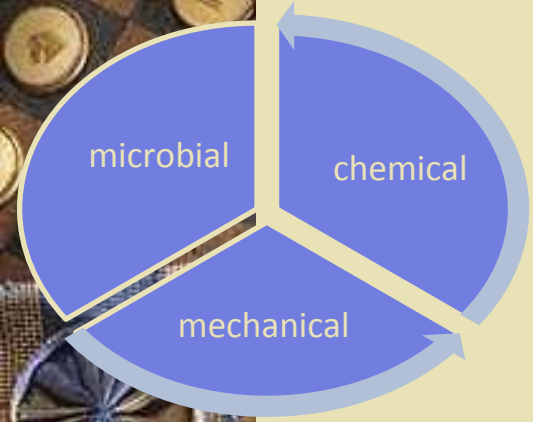
- Flare-up is described as the occurrence of pain, swelling or the combination of these during the course of root canal therapy, which results in unscheduled visits by patient.
- Pain may occur soon after initiating endodontic treatment for an asymptomatic tooth or shortly after the initial emergency treatment or during the course of treatment.

  Gerald W Harrington,1992.
- American Association of Endodontic (AAE) defines a flare-up “as an acute exacerbation of periradicular pathosis after initiation or in continuation of root canal treatment.
- Flare ups may occur with the best of the therapy, but most flare ups occur when improper treatment is rendered or when insufficient time is allowed for specific modalities in therapy according to Franklin S Weine

ETIOLOGY

The occurrence of flare-ups during the endodontic therapy is a polyetiologic phenomenon.





Causative Factors

Mechanical injury may occur in form of :

1- Over instrumentation—most common cause of mid treatment flare-ups.

2-Inadequate debridement or incomplete removal of pulp tissue can result in pain

3-Periapical extrusion of debris can lead to periapical inflammation and flare-ups.

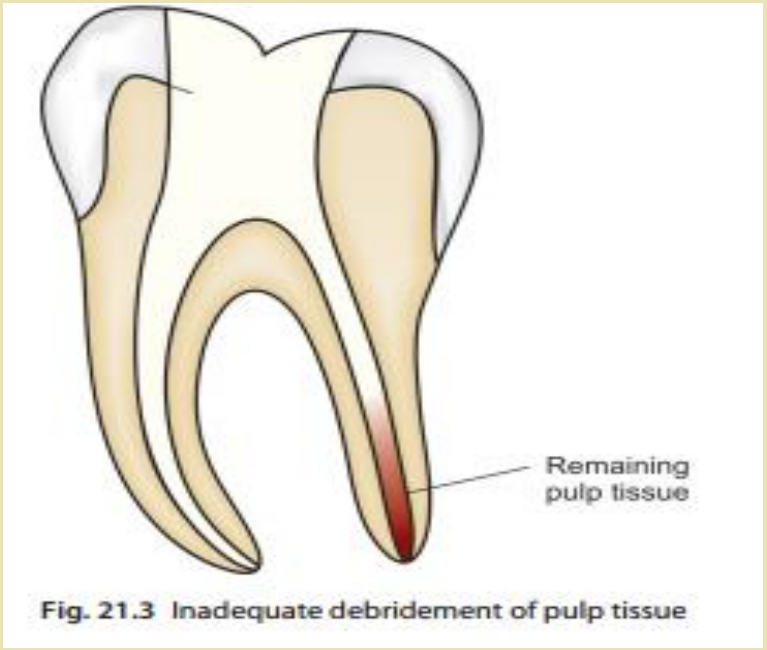
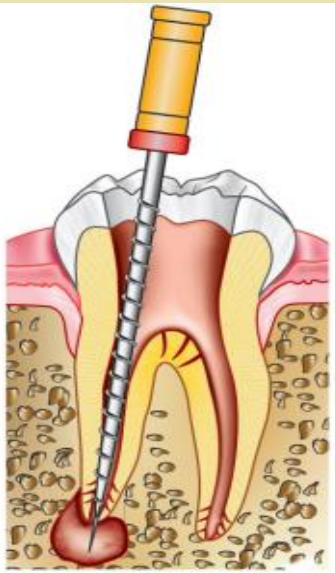
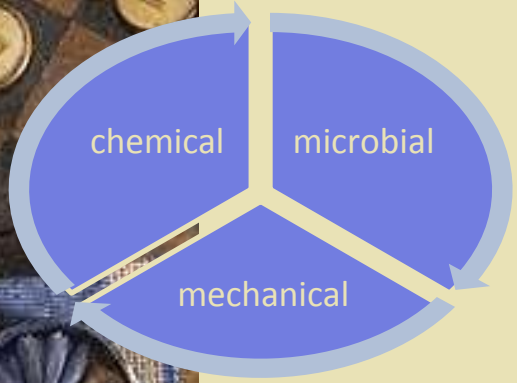


Fig. 21.3 Inadequate debridement of pulp tissue



2 Overinstrumentation is most common cause of midtreatment flare-ups

Fig. 21.4 Periapical extrusion of debris

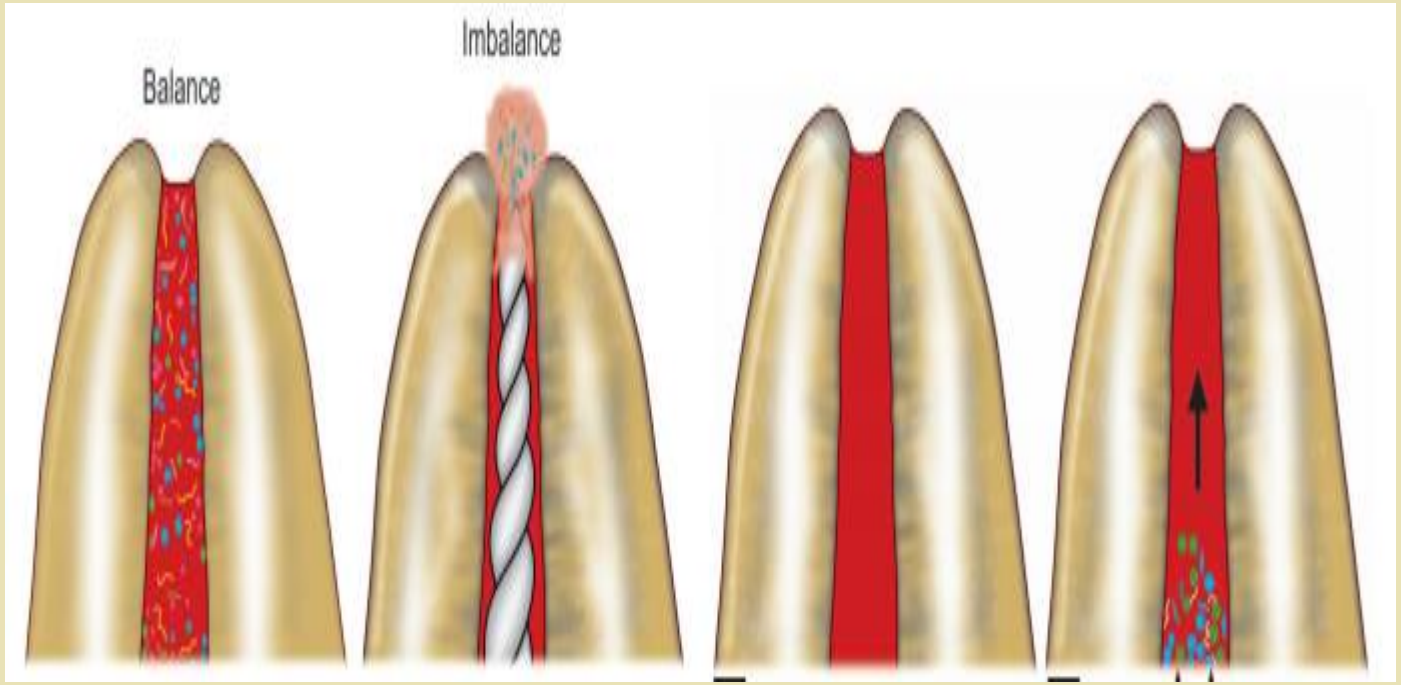


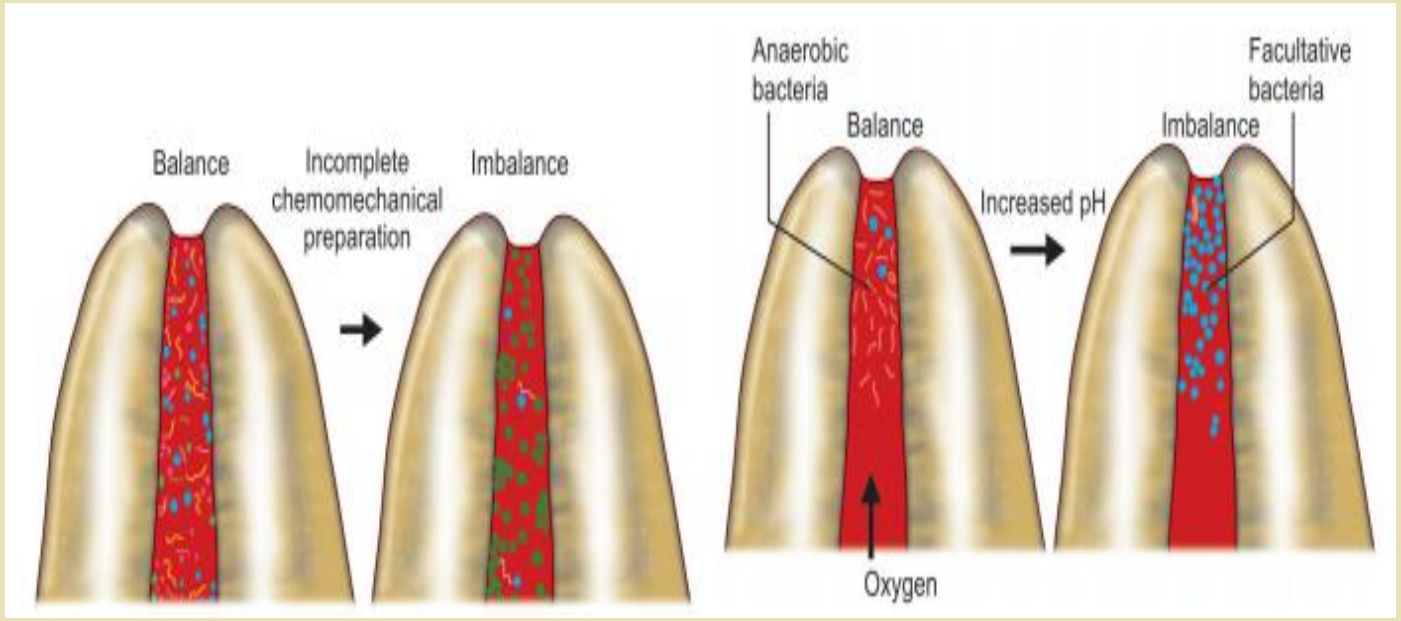
Causative Factors

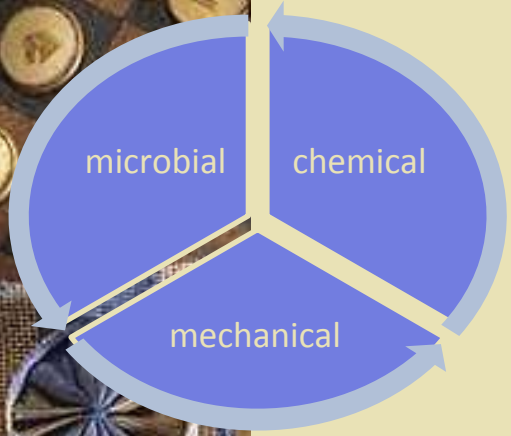
Microbial Induced Injury:

Microbial induced injury is considered as the most significant factor in the flare-up pathogenesis. Microbial factors may be combined with iatrogenic factors to cause inter-appointment pain.

The cause of injury may vary, but the intensity of inflammatory response is usually directly proportional to the intensity of tissue injury.


Balance
Imbalance


Balance
Incomplete chemomechanical preparation
Imbalance
Anaerobic bacteria
Balance
Increased pH
Imbalance
Facultative bacteria
Oxygen



Causative Factors

Chemical Induced Injury:

1-Irrigation solutions
2-Intracanal medicaments
3-over extended Root filling

Contributing Factors

Age :

Patients in the 40–59 years range have the most flare-ups and those under the age of 20 have the least.

Gender

A higher percentage of females than males have been reported with the postoperative pain in a number of studies.

Systemic Conditions

Medical status of the patient is an important variable in the occurrence of flare-ups.

Patients with allergies

to various substances (sulfa medication, pollen, dust and food stuffs) have a higher frequency of inter-appointment pain.

Tooth Type

Mandibular teeth are more associated with inter-appointment emergencies than maxillary teeth.

Anxiety

Anxious patients are likely to have more pain during the course of the treatment.

Contributing Factors

Presence of Preoperative Pain and/or Swelling:

Patients taking analgesics and anti-inflammatory drugs so as to prevent preoperative pain have shown higher incidence of flare-ups.

Pulpal / Periapical Status:

Teeth with vital pulps show lower incidence of flare-ups as compared to teeth with necrotic pulp.

Periradicular status of the tooth can also predict the flare-up rates, with incidence of 3.4 percent in chronic apical periodontitis, 4.8 percent in acute apical periodontitis and 13.1 percent in case of acute apical abscess.

Presence of a sinus tract is not associated with the development of flare-up .

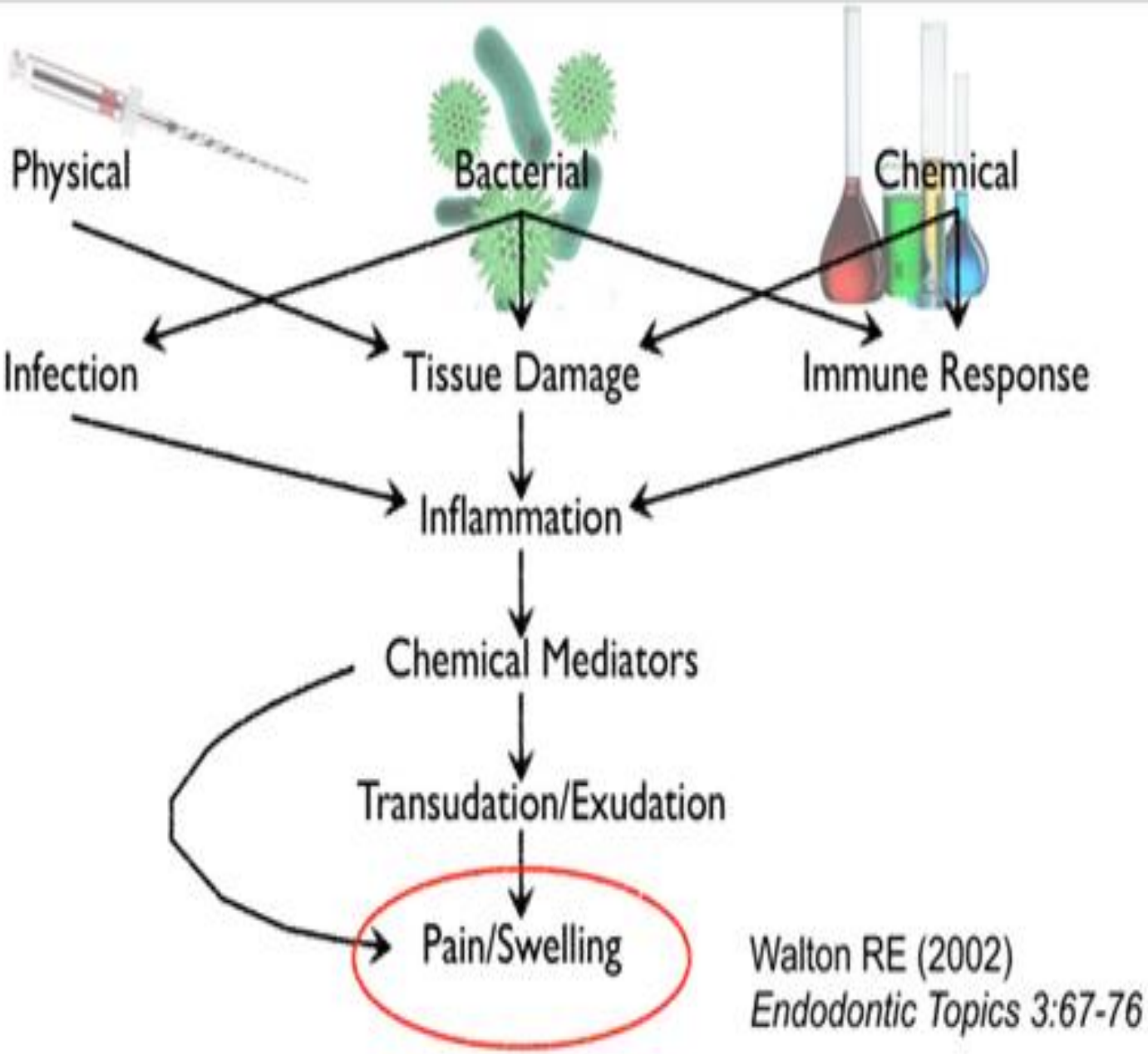
Number of Visits : If proper case selection is not done, more flare-ups occur after multi-visit approach as compared to single visit approach to endodontic.

Retreatment Cases : Chances of flare-ups are 10 fold higher in the retreatment cases because of extrusion of infected debris or solvents into periapical tissues

Mechanism

Seven microbiological and immunological factors are seen to be responsible for flare-ups (Seltzer et al. 2004) .

1. Alteration of local adaptation syndrome
2. Changes in periapical tissue pressure.
3. Microbial factors.
4. Chemical mediators.
5. Changes in cyclic nucleotides.
6. Immunological responses
7. Psychological factors.


Physical
Bacterial
Chemical
Infection
Tissue Damage
Immune Response
Inflammation
Chemical Mediators
Transudation/Exudation
Pain/Swelling
Walton RE (2002)
Endodontic Topics 3:67-76

Periradicular injury

- Release of chemical substances
  - Vasodilation, vascular permeability, chemotaxis
  - Vascular permeability causes Edema and exudation
- some chemical mediators directly stimulate nerve fibres
  - Increase in tissue hydrostatic pressure-compression of nerves

CLINICAL CONDITIONS RELATED TO FLARE-UP

ENDODONTIC EMERGENCIES

Interappointment flare-ups.

1- Apical periodontitis

2- Incomplete removal of the pulp tissue

3- phoenix abscess

4-Recurrent periapical abscess.

5-Flare-ups related to necrotic pulp

Postobturation flare-ups.

1- Apical Periodontitis Secondary to Treatment

An asymptomatic tooth before the initiation of endodontic treatment becomes sensitive to percussion during the course of treatment, In this condition, pain may become severe causing a throbbing or gnawing pain.

The cause this pain may be:

Over instrumentation
Over medication
Forcing debris into periapical tissues.

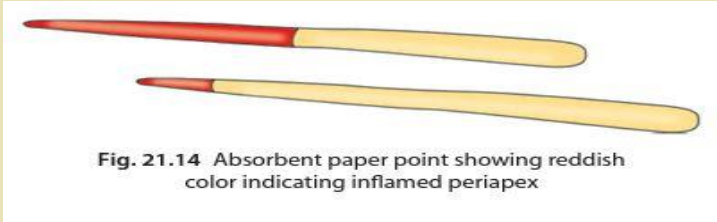


Fig. 21.14 Absorbent paper point showing reddish color indicating inflamed periapex

Confirmatory test:

Use a sterile paper point ‘the paper point tip will disclosed a reddish or brownish color.

Management:

An intra canal corticosteroid-antibiotic medication is given to the patient for symptomatic relief. Routine endodontic therapy may be continued after 2 to 5 days after readjusting the working length.

2- Incomplete removal of the pulp tissue

Whenever a pulpotomy or partial pulpectomy has been done, the patient may experience pain due to incomplete removal of inflammed pulp tissue.
In this condition, sensitivity to hot and cold or pain on percussion is usually seen.

Confirmatory test:

Apply rubber dam, place a sterile paper point, of course short of working length. When paper point is removed, it will display brownish discoloration indicative of inflamed seeping tissue.

Management:

The working length is re-established established the remaining pulp tissue is removed.

Fig. 21.3 Inadequate debridement of pulp tissue

g. 21.15 Incomplete removal of pulp tissue

3- phoenix abscess

Recrudescence of Chronic Apical Periodontitis (Phoenix Abscess)

It is a condition that occurs in teeth with necrotic pulps and apical lesions that are asymptomatic. There is exacerbation of previously asymptomatic periradicular lesion.

The reason : the alteration of the internal environment of root canal space during instrumentation which activates the bacterial flora.

sign and symptoms:

Mobility, tenderness and swelling are usually the found in phoenix abscess.

Management:

drainage

Irrigation with warm sterile saline or water helps to encourage the drainage.

Drainage is allowed until the exudation ceases or a slight clear serum drains.

The canal is then irrigated with
sodium hypochlorite,
dried with paper point;
filled with an appropriate intracanal medicament (calcium hydroxide paste)
sealed with a dry cotton pellet
and a temporary filling.

4-Recurrent periapical abscess.

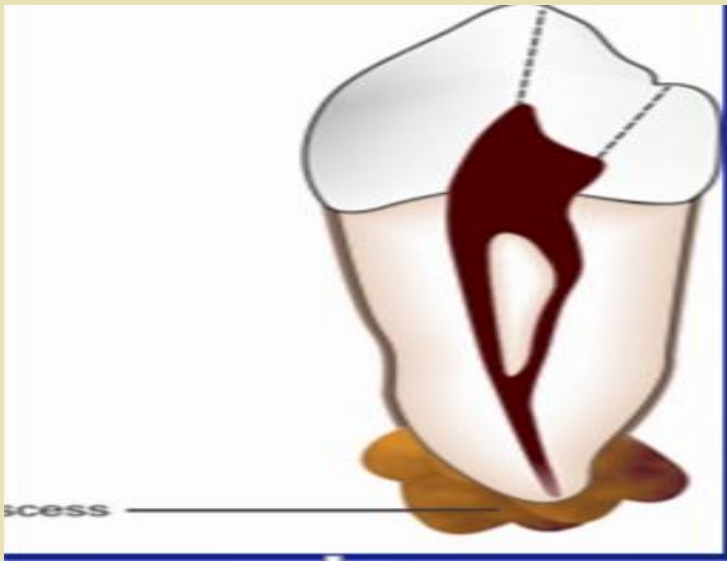
It is a condition where a tooth with an acute periapical abscess is relieved by emergency treatment after which the acute symptoms return.

The reason :

the abscess may recur more than once, due to microorganism of high virulence or it results in resistance.

Management:

The management and treatment are the same as for discussed above for phoenix abscess.



5-Flare-ups related to necrotic pulp

Teeth with necrotic pulp often develop as acute apical abscess after the initial appointment.

As the lesion, is confined to bone, there occurs severe pain.

Management:

The drainage is established, canal copiously irrigated, placing an intra canal medicament of calcium hydroxide the tooth sealed.

Increasing the appointment time allows more exposure of the bacteria to irrigants like hydrogen peroxide and sodium hypochlorite, thus reducing the chances of flare-ups.

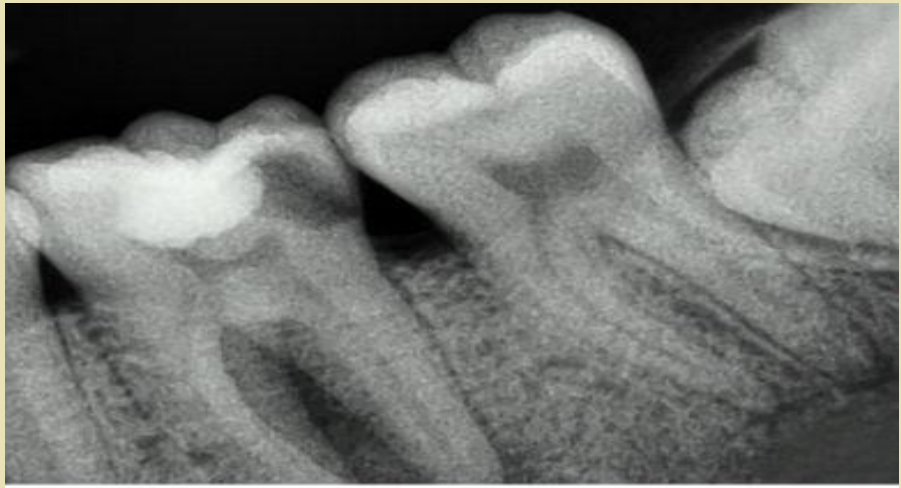


Fig. 21.16 36 showing deep caries resulting in pulp necrosis

Postobturation flare-ups.

Postobturation flare-ups are relatively infrequent as compared to interappointment flare-ups. Only one-third of the endodontic patients experience some pain after obturation.
A mild pain is usually present which may resolve spontaneously.

The reason :

Patients experiencing preoperative pain are more likely to suffer from postobturation flare-ups.
Another cause of postobturation flare-ups may be over-extended root canal fillings.

Management:

Mild to moderate pain may be controlled with analgesics.
severe pain, retreatment is indicated.
When nonsurgical retreatment is not possible,
surgical intervention is required.

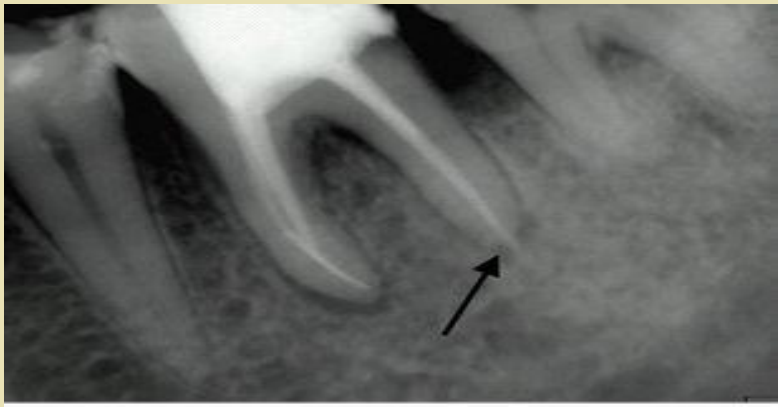


Fig. 21.5 Overextended filling material may result in severe postoperative pain

MANAGEMENT OF FLARE-UPS

As the etiology of flare-ups is multifactorial, many treatment options have been empirically advocated for the prevention and alleviation of symptoms during the root canal therapy.

PREVENTIVE

DEFINITIVE.

Preventive Management

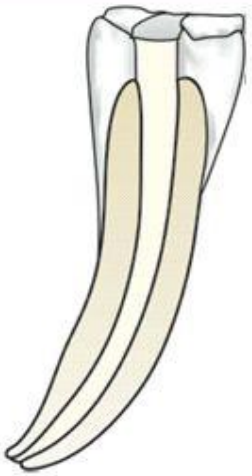
Precaution taken to prevent flare-ups :

1) Proper diagnosis.
2) Long acting local anesthesia.
3) Determination of proper working length.
4) Complete debridement.
5) Occlusal reduction.
6) Placement of intracanal medicament in case of multi-visit root canal treatment.
7) Medications.
8) Closed dressing.
9) Behavioral management.
10) Maintain asepsis

Preventive Management contu

1) **Proper diagnosis :**
   proper diagnosis of the condition should be made so as to prevent incorrect treatment
1) **Long acting local anesthesia** :
   e.g. bupivacaine, provide increased period of analgesia for up to 8-10 hours during the immediate postoperative period.
1) **Determination of proper W/L.**
   to avoid under or over instrumentation and extrusion of debris, irrigants, medicaments or filling materials beyond the apex
1) **Complete debridement:**
   may decrease the incidence of flare-ups.

Maintenance of apical patency and crown-down preparation technique are two important factors in the management of flare-ups.



21.17 Complete cleaning and shaping of root canal system

Preventive Management

5) **Occlusal reduction:**

The relief of pain provided by Occlusal reduction is due to the reduction of mechanical stimulation of sensitized nociceptors

6) **Placement of intracanal medicament in case of multi-visit RCT.**

Calcium hydroxide :

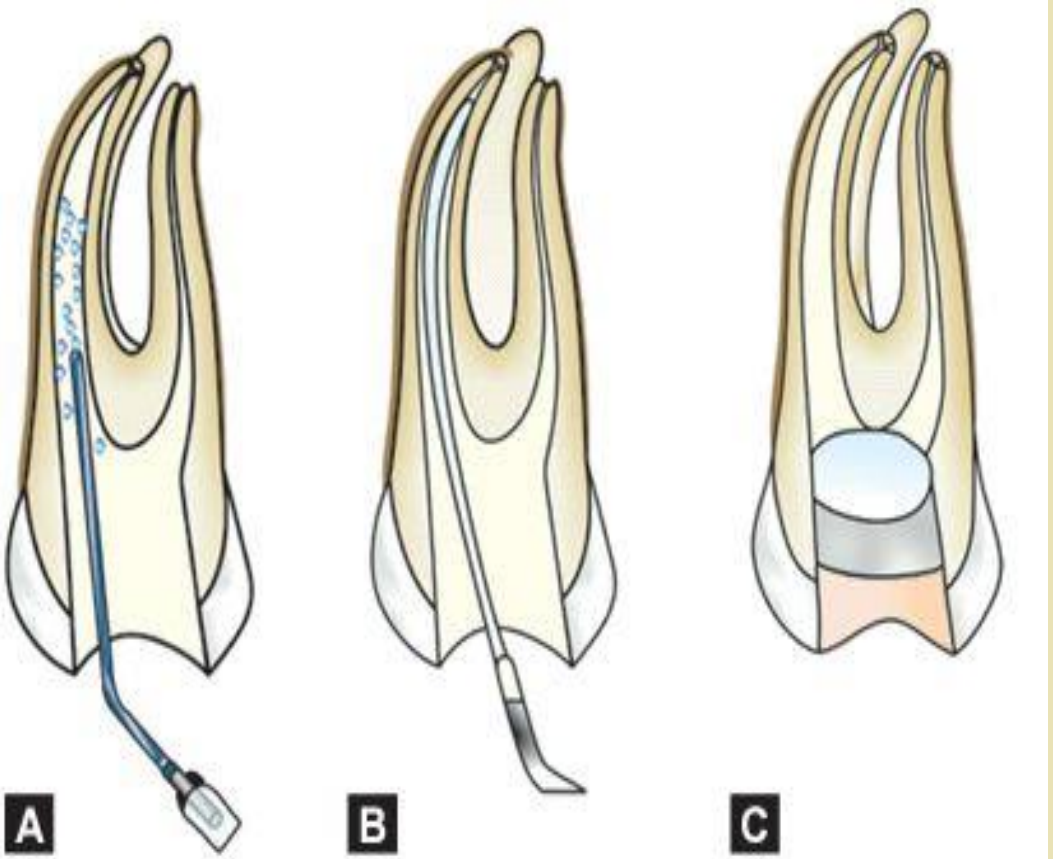
for the prevention or the treatment of flare-up due to these reason:

- Antimicrobial action: remains in the canal for one week.
- It obliterates the root canal space which minimizes the ingress of tissue exudates, a potential source of nourishment of remaining bacteria
- periapically reduces inflammatory reaction .
- has soft tissue dissolving property because of high pH

Chlorhexidine gluconate and **iodine potassium iodide** :

are other primary medicaments that can be considered.

The use of phenolic medicaments that have an immunologic potential should be avoided to prevent the occurrence of flare-up



Figs 21.18A to C (A) Irrigation of canal for final cleaning of the canal; (B) Drying of the canal using absorbent paper point; (C) Placement of intracanal medicament

Fig. 21.19 Placement of $Ca(OH)_2$ in canal

Preventive Management

7) **Medications.**

Systemic antibiotics:

- not indicated in the prevention of flare-ups for healthy patients with localized infection.
- Antibiotics should be recommended only in cases of medically compromised patients at high risk levels and in cases of spreading infection .
- The commonly prescribed antibiotics include penicillin, erythromycin or cephalosporin. Metronidazole, tinidazole, ornidazole and clindamycin are also used because of their efficacy against anaerobic bacteria.

Analgesics:

- (NSAIDs) and acetaminophen are the most commonly used drugs to reduce pain.
- Treatment with an NSAID before a procedure has shown to reduce postoperative pain.
- Most commonly used drugs include ibuprofen, diclofenac sodium and ketorolac.

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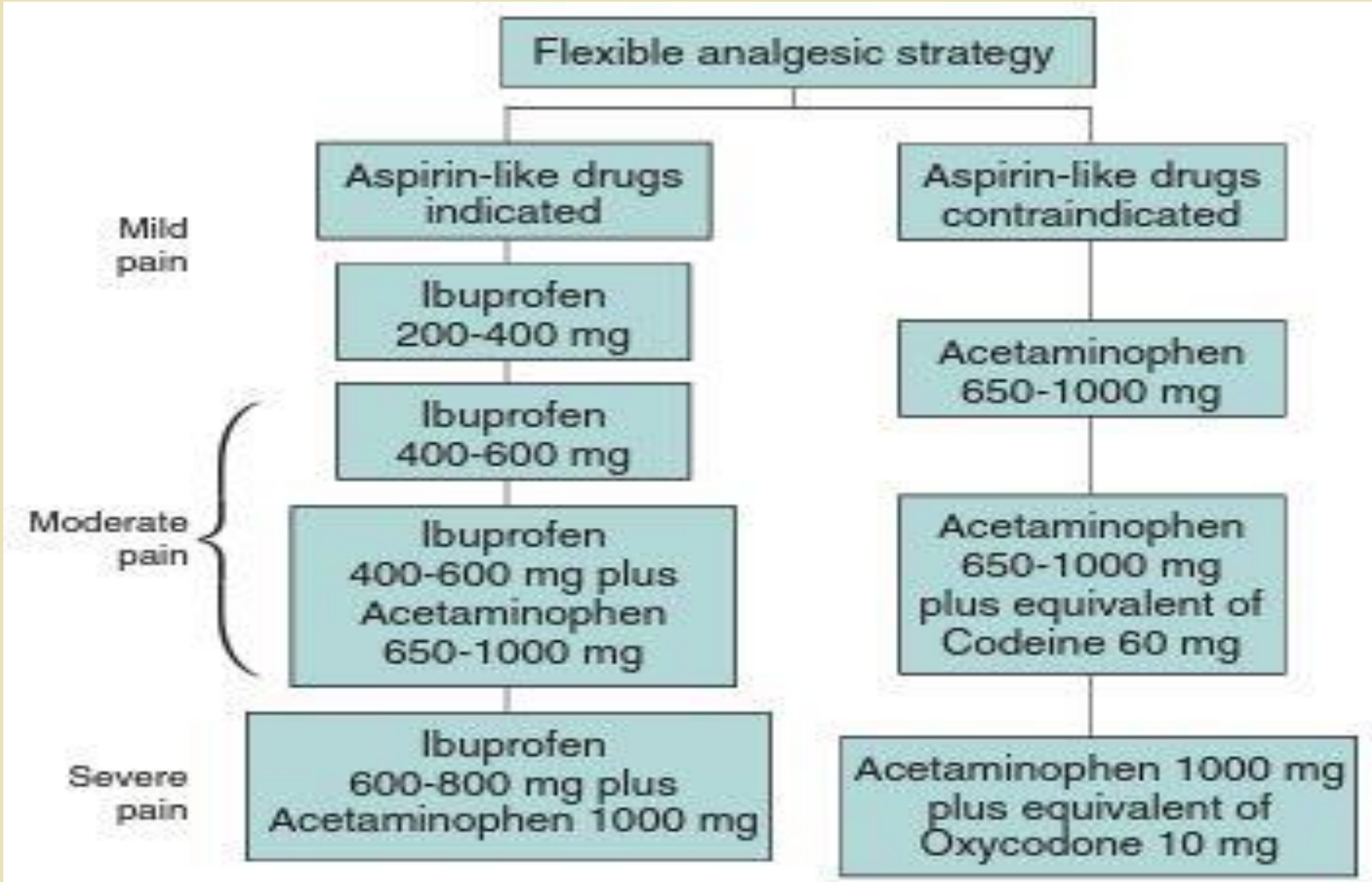


Figure 9-6 Simplified analgesic strategy to guide drug selection based upon patient history and level of present or anticipated posttreatment pain.

8)Maintain asepsis

Clinician should be aware of the need to perform clinical procedures in aseptic condition

Definitive Treatment

Management of flare-ups:

1-Drainage through coronal access opening.

2-Incision and drainage.

3-Proper instrumentation.

4-Trephination.

5-Intracanal medicaments.

6-Analgesics and antibiotics (when indicated).

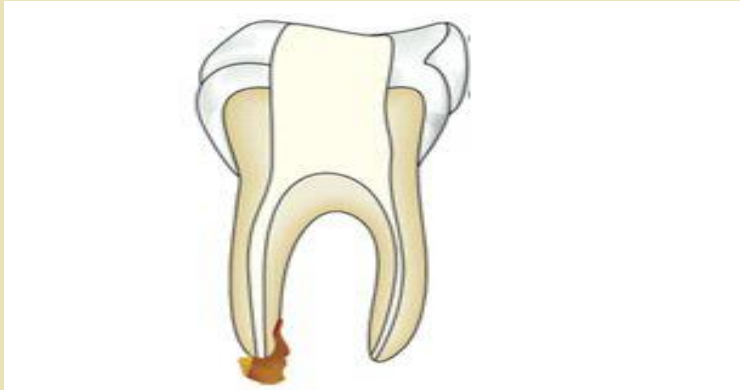
Definitive Treatment

Drainage through coronal access :

The first step in relieving the pain is to establish drainage through the following the root canal,

when it has not been obturated or poor obturated.

Apical trephination : In patients with periradicular abscess but no drainage through the canal, penetration of the apical foramen with small files (up to no. 25) may establish drainage that helps in reducing the periapical pressure and thus alleviating the symptoms



21.20 Opening of pulp chamber to allow drainage

Definitive Treatment

2. Incision and drainage :

Occasionally more than one abscess is present in relation to the tooth.

One communicates with the apex, while other is present in the vestibule.

As they do not communicate with one another, flare-up can be best managed through a combination of canal instrumentation and incision and drainage

3. Proper instrumentation:

- **Under profound local anesthesia,**
- **working length should be re-established,**
- **apical patency obtained and thorough chemomechanical preparation is done.**

This removes the necrotic tissue, microorganisms and toxic products responsible for causing pain.

Definitive Treatment

4. Trephination

- When drainage through the canal is not possible due to restorative issues, or in case of certain conditions like failing treatments or necessary correction of procedural accidents, surgical trephination can be used as a palliative measure.
- It involves the surgical perforation of the alveolar cortical plate over the root-end to release the accumulated exudates to release pain. However, it is not the first line of treatment because of the additional trauma, invasiveness and questionable beneficial result.

5. Intracanal medicaments:

Use of corticosteroid-antibiotic combination as an intracanal medicament has been recommended to reduce pain, especially in cases of over instrumentation.

Definitive Treatment

6. Analgesics and antibiotics (when indicated

- **Analgesics:**
  - NSAID
  - -- NSAIDs with opoid analgesics

Commonly used opoids include morphine, codeine, meperidine, tramadol and propoxyphene.

- **Antibiotics**:

are prescribed for the treatment of flare-ups only when indicated as discussed before.

- ***Use of antihistaminics for treatment of flare-ups has also been suggested.***

Diagnosis and management

Establishing the cause is an important step towards the management.

Inter-appointment emergencies is divided into:

1-Previously vital pulp with complete debridement.

2-Previously vital pulp with incomplete debridement.

3-Previously necrotic pulp without swelling.

4-Previously necrotic pulp with swelling.

Previously vital pulp with complete debridement..

Here chance of flare-up is less.

Only patient reassurance and prescription of mild to moderate analgesic.

There is no need to re-opening the canal and place corticosteroid.

Previously vital pulp with incomplete debridement.

Here pulp remnants considered to be a major irritant, causing sever pain.

- W/L should be rechecked.
- Canal cleaned with copious irrigation of NaoCl
- Dry cotton pellet is placed + T.F
- Mild analgesic is prescribed.
- Relieve tooth from occlusion.

note : Occasionally, a previously vital pulp (with or without complete débridement) will develop into an acute apical abscess. This will occur some time after the appointment and indicates that pulpal remnants have become necrotic and are invaded by bacteria.

Previously necrotic pulp without swelling

The abscess is to bone and can be very painful Occasionally, these teeth develop an acute apical abscess (fl are-up) after the appointment.

1-Establish accurate W/L.

2-Complete instrumentation.

3-Irrigation with copious amount of NaoCl.

4-If there is active drainage or not from the canal, after drying the canal place CaOH canal .

5-A long-acting anesthetic and an analgesic regimen for moderate to severe pain are helpful.

Figure 9-8 After opening into the root canal and establishment of drainage, instrumentation should be confined to the root canal system. Release of purulence removes a potent irritant (pus) and relieves pressure.

Previously necrotic pulp with swelling.

These cases are best managed by incision and drainage.
Canal should be opened debrided and gently irrigated with NaoCl.
Ca(OH)2 should be placed and closed.

Occasionally but rarely, a flare-up or a presenting acute apical abscess may be serious (cellulitis) or even life-threatening (see Figure 9-12). These situations may require hospitalization and aggressive therapy with the cooperation of an oral surgeon

Figure 9-12 Progressively spreading swelling from a flare-up resulting in an acute apical abscess from a mandibular second molar. **A**, The swelling has extended to the infratemporal, submandibular, pharyngeal, and sublingual spaces. This condition compromised the patient's airway, requiring hospitalization for aggressive therapy that included nasal intubation **(B)** and placement of extraoral drains to different involved spaces **(C).** These severe infections are best managed by an oral surgeon.

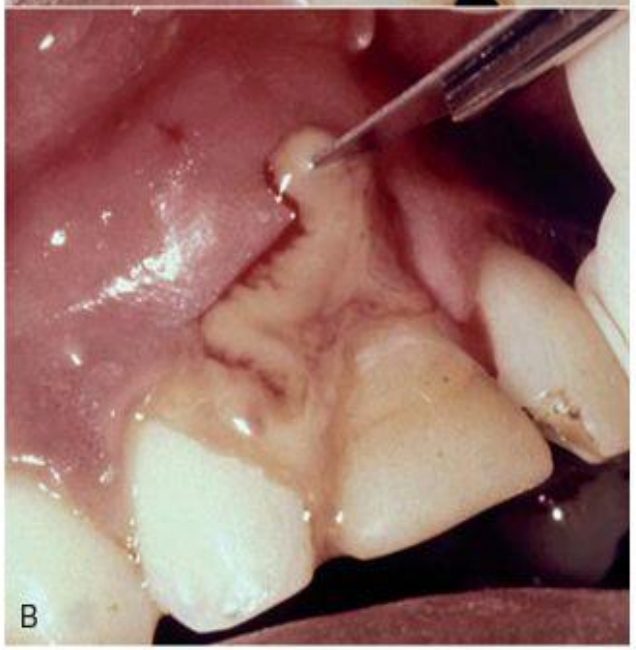


Figure 9-7 **A**, Localized swelling. **B**, Incision for drainage after cleaning and shaping offending incisor. (Courtesy Dr. E. Rivera.)

References

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